Reviewer's report

Title: The validity of using ICD-9 codes and pharmacy records to identify patients with chronic obstructive pulmonary disease

Version: 1 Date: 2 October 2010

Reviewer: Paul Enright

Reviewer's report:

The authors use a large VA database to describe the validity of COPD-related ICD-9 codes when compared to objective test results (airway obstruction on post-BD spirometry).

Since more than half of those with a COPD-related ICD-9 code had no airway obstruction, in the conclusion, change the phrase "likely misclassify a significant number..." (now understood to mean a statistical difference which is usually not clinically important) to something like "misclassifies the majority of patients..."

The use of two "gold standards" (a type of sensitivity analysis) is appropriate, since a large worldwide group of experts are calling for the industry-sponsored GOLD guidelines to discontinue their recommendation using post-BD FEV1/FVC <0.70 to define COPD since it causes very high COPD misclassification rates in older people. Two major ATS/ERS committees have disagreed for ten years regarding the definition of airway obstruction, so it should not be stated that using the fixed ratio to define COPD is "consistent with ATS/ERS standards." I recommend labels of GOLD and LLN (instead of GOLD and Hankinson). The gold standard LLN definition of COPD should require that both the post-BD FEV1/FVC and the FEV1 itself fall below their respective fifth percentile LLNs. A good argument could be made for using a definition of clinically-important COPD which includes only those with a post-BD FEV1 below 65% predicted (in the middle of GOLD stage two).

Major: Stratify model 1 into separate ICD-9 codes (or add separate models for each of the three primary COPD-related ICD-9 codes instead of only lumping them together). It is highly likely that the use of 491.xx chronic bronchitis has a much higher false positive rate for airway obstruction when compared to 496.xx chronic airway obstruction.

Major: It is misleading to conclude that the models using GOLD definition performed better than the models using the LLN definition (which infers that the GOLD definition is more appropriate). The AUCs, Brier scores, and HL goodness of fit statistics were nearly identical and no statistical comparison between these models was done. If a stronger association between the fixed ratio and COPD-related ICD-9 codes actually exists, it is probably due to the inclusion (in both sides of the model) of patients with chronic bronchitis who have no airway obstruction (the O in COPD).
Are the results for each of the 9 models in table 2 somehow combined for the pairs of models stratified by age group? Table 3 provides the results for model 8 for each age group separately.

The coefficients for age would be easier to understand if given per decade (instead of per year).

Minor stuff: dose is spelled does in the abstract. References 7, 15, 18, and 37 are not complete (no page numbers).

Level of interest: An article of importance in its field

Quality of written English: Acceptable

Statistical review: Yes, but I do not feel adequately qualified to assess the statistics.

Declaration of competing interests:

I declare that I have no competing interests. I have met some of the authors of this manuscript; have had lunch or dinner with them; and I like them; but I have never worked with them on a project.